REMARKS

In response to the Office Action dated June 1, 2007, claims 1, 3, 13, 14, 28, 29, 40 and 55 have been amended and claim 33 has been canceled. Therefore, claims 1-32 and 34-63 are now in the case. In light of the amendments and arguments set forth herein, reexamination and reconsideration of the application are requested.

Section 101 Rejections

The Office Action rejected claims 1-63 under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. The Office Action stated that "[T]he claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful and tangible result."

In response, the Applicants have amended independent claims 1, 14, 29, 40, and 55 such that these amended claims now recite a concrete, useful, and tangible result. In particular, in amended independent claim 1, the concrete, useful, and tangible result of "displaying the page rankings to a user" has been added. For amended independent claims 14 and 29, the concrete, useful, and tangible result of "displaying the updated search results to a user" has been added. For amended independent claim 40, the concrete, useful, and tangible result of "displaying the enhanced search results to a user" has been added. For amended independent claim 55, the concrete, useful, and tangible result of "a display device on which the enhanced search results are displayed" has been added.

With regard to dependent claims 13 and 28, the Office Action stated that the "claimed 'medium' fails to fall with one of four statutory categories of invention, process, machine, manufacture and composition, since it fails to produce a useful and tangible result."

In response, the Applicants have amended claims 13 and 28 to recite a "[A] computer-readable storage medium having stored thereon computer-executable

instructions" and "[O]ne or more computer-readable storage media having computer-readable instructions stored thereon" As stated in the Applicants' specification, "computer readable media may comprise computer *storage media* and communication media. Computer storage media includes volatile and nonvolatile removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computer 210. Communication media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media" (specification, page 14, lines 15-30; emphasis added). Thus, the computer storage medium is a concrete and tangible product or thing.

Accordingly, the Applicants respectfully submit that amended independent claims 1, 14, 29, 40, and 55 and dependent claim 13 and 28 are patentable under 35 U.S.C. § 101 based on the amendments to claims 1, 13, 14, 28, 29, 40, and 55 and the legal and technical arguments set forth above and below.

Moreover, claims 2-13 depend from amended independent claim 1, claims 15-28 depend from amended independent claim 14, claims 30-32 and 34-39 depend from amended independent claim 29, claims 41-54 depend from amended independent claim 40, and claims 56-63 depend from amended independent claim 55, and thus also contain patentable subject matter (MPEP § 2143.03). The Applicants, therefore, respectfully request reexamination, reconsideration and withdrawal of the rejection of claims 1-63 under 35 U.S.C. § 101.

<u>Section 103(a) Rejections</u>

The Office Action rejected claims 1-63 under 35 U.S.C. § 103(a) as being unpatentable over a paper by Page et al. entitled "The Page Rank Citation Ranking: Bringing Order to the Web - 1998," and in view of a paper by Pei et al. entitled "Mining Access Patterns Efficiently from Web Logs". The Office Action contended that the combination of Page et al. and Pei et al. teaches all the elements of the Applicants' claimed invention. In particular, the Office Action stated that Page et al. disclose all the elements of the Applicants' claimed invention except that "Page fails to explicitly disclose extracting implicit links from the user access log." However, the Office Action stated that Pei et al. disclose "extracting implicit links from the user access log."

In response, the Applicants respectfully traverse these rejections. In general, the Applicants submit that the combination of Page et al. and Pei et al. is lacking several claims features. More specifically, neither Page et al. nor Pei et al. disclose, either explicitly or implicitly, the material claimed features of: (1) generating an implicit links graph from the extracted implicit links; and, (2) generating ordered pairs of implicit links from the user access log.

The combination of Page et al. and Pei et al. also fails to appreciate the advantages of these claimed features. In addition, there is no technical suggestion or motivation disclosed in either Page et al. or Pei et al. to define these claimed features. Thus, the Applicants submit that the combination of Page et al. and Pei et al. cannot make obvious the Applicants' claimed features listed above.

To make a prima facie showing of obviousness, all of the claimed features of an Applicant's invention must be considered, especially when they are missing from the prior art. If a claimed feature is not disclosed in the prior art and has advantages not appreciated by the prior art, then no prima facie showing of obviousness has been made. The Federal Circuit Court has held that it was an error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Moreover, as stated in the MPEP, if a prior art reference does

not <u>disclose, suggest</u> or provide any <u>motivation</u> for at least one claimed feature of an Applicant's invention, then a prima facie case of obviousness has not been established (MPEP § 2142).

<u>Amended Independent Claims 1, 14, and 29</u>

Amended independent claim 1 of the Applicant's claimed invention includes a computer-implemented method for generating page rankings using a user access log. The method includes extracting implicit links from the user access log, <u>generating</u> an <u>implicit links graph</u> from the <u>extracted implicit links</u>, computing page rankings using the implicit links graph, and displaying the page rankings to a user.

Amended independent claim 14 of the Applicant's claimed invention includes a process for enhancing initial results obtained from a search engine on a computer using a user access log. The process includes extracting implicit links of pages from the user access log using a two-item sequential pattern mining technique, <u>generating</u> an <u>implicit links graph</u> from the <u>implicit links</u>, and generating two-item sequential patterns from the implicit links. The process further includes updating the implicit links graph using the two-item sequential patterns, re-ranking the initial search results using the updated implicit links graph to generate updated search results, and displaying the updated search results to a user.

Amended independent claim 29 of the Applicant's claimed invention includes a computer-readable medium having computer-executable instructions for enhancing local searching of web sites and intranets by mining user access logs. The instructions include segmenting the user access log into different browsing sessions, generating ordered pairs of pages from the browsing sessions to find implicit links by using a gliding window to move over explicit paths of the browsing sessions to generate the ordered pairs of pages, and constructing an <u>implicit links graph from the implicit links</u>. The instructions also include generating two-item sequential patterns from the ordered pairs, updating the implicit links graph using the two-item sequential patterns, re-ranking

search results obtained from a search engine to enhance the local searching to produce updated search results, and displaying the updated search results to a user.

In the Applicants' claimed invention "implicit links are implicit recommendation links" (specification, page 6, line 15). "All probable implicit links then are extracted from the user access log using a two-item sequential pattern mining technique" (specification, page 6, lines 16-17). An "implicit links graph is constructed using the extracted implicit links" (specification, page 6, lines 18-19). The "implicit links graph is used in place of an explicit link graph used in conventional link analysis techniques" (specification, page 19, lines 5-6). More specifically, "[T]he implicit links search enhancement system and method constructs an *implicit link graph instead of the traditional explicit link graph* in a small web sub-space. This implicit links graph is a weighted directed graph $G' = (V, E')$, where V is same as above, *except that E′ encompasses the implicit links between pages*. Furthermore, each implicit link $l_{i,j} \in E'$ is associated with a new parameter $P(w_j | w_i)$ denoting the conditional probability of the page w_j to be visited given current page w_i" (specification, page 20, lines 6-12; emphasis added).

In contrast, Page et al. merely discloses a global search engine algorithm that uses an explicit links graph to rank a page. In particular, "for the global Web, existing link analysis uses explicit links to a certain site to determine the ranking of the site. While this recommendation assumption is generally correct for the Web, it is commonly invalid for a Web site or intranet. In general, this is because there are relatively few explicit links and the links are created by a small number of authors whose purpose is to organize the contents into a hierarchical structure. Thus, in general the authority of pages is not captured correctly by link analysis" (specification, page 4, lines 20-26). Thus, Page et al. generates an <u>explicit links graph</u> from <u>explicit links</u>, while the Applicants' claimed invention generates an <u>implicit links graph</u> from the extracted <u>implicit links</u>.

The Office Action stated that this feature of "generating an implicit links graph from the extracted implicit links" is described by Figure 7 of Page et al. However, Figure 7 is merely a screen shot from a proxy that is created using <u>explicit links</u>.

In addition, Pei et al. adds nothing to the cited combination that would render the Applicants' claimed invention obvious. Specifically, Pei et al. merely disclose efficient Web access pattern mining from Web logs. However, nowhere do Pei et al. disclose the Applicants' claimed feature of generating an implicit links graph from the extracted implicit links.

The combination of Page et al. and Pei et al. also fails to appreciate or recognize the advantages of the Applicants' claimed feature of generating an implicit links graph from the extracted implicit links. More specifically, this claimed feature improves the performance and efficiency of local search engines by using an implicit links graph instead of an explicit links graph (specification, page 4, lines 18-26). Neither Page et al. nor Pei et al. discuss or appreciate these advantages of this claimed feature of the Applicants' invention.

The Applicant, therefore, submits that obviousness cannot be established since the combination of Page et al. and Pei et al. fails to teach, disclose, suggest or provide any motivation for the Applicants' claimed feature of generating an implicit links graph from the extracted implicit links. In addition to explicitly lacking this feature, Page et al. and Pei et al. fail to implicitly disclose, suggest, or provide motivation for this feature. Further, the combination fails to appreciate advantages of this claimed feature.

Amended Independent Claims 29, 40 and 55; Dependent Claims 3 and 9

Amended independent claim 29 (discussed above) also includes generating ordered pairs of pages from the browsing sessions to find implicit links by using a gliding window to move over explicit paths of the browsing sessions to generate the ordered pairs of pages.

Amended independent claim 40 of the Applicant's claimed invention includes a computer-implemented method contained on computer-readable media having computer-executable instructions for execution on a computing device for enhancing

initial search results of a search engine performing a local search of a web sub-space using a user access log. The instructions include pre-processing the user access log, segmenting the log into browsing sessions, and <u>generating ordered pairs of implicit links</u> from the browsing sessions. The instructions also include filtering the ordered pairs using a minimum support threshold to remove any infrequently occurring ordered pairs to generate two-item sequential patterns, updating an implicit links graph using the two-item sequential patterns, re-ranking the initial search results using the updated implicit links graph to generate enhanced search results, and displaying the enhanced search results to a user.

Amended independent claim 55 of the Applicant's claimed invention includes an implicit links search enhancement system for an enhancing initial search results obtained from a search engine by mining a user access log. The system includes an ordered pairs generator that <u>generates ordered pairs of implicit links</u> from the user access log, an update module that updates an implicit links graph using the ordered pairs, a re-ranking module that re-ranks the initial search results based on a modified link analysis technique to generates enhanced search results, and a display device on which the enhanced search results are displayed.

Dependent claim 3 of the Applicant's claimed invention includes extracting implicit links by using a two-item sequential pattern mining technique to extract the implicit links from the plurality of different browsing sessions.

Dependent claim 9 of the Applicant's claimed invention includes moving a gliding window over each explicit link path in the user access log.

In the Applicants' claimed invention "[A]ll probably implicit links . . . are extracted from the user access log using a two-item sequential pattern mining technique. This technique includes using a gliding window to find ordered pairs of implicit links or pages" (specification, page 6, line 16-18). The "ordered pairs are generated from the segmented user access log" (specification, page 7, lines 3-4).

In contrast, Page et al. merely discloses a global search engine algorithm that uses an explicit links graph to rank a page. Nowhere do Page et al. mention generating ordered pairs of implicit links. This is because Page et al. use explicit links. The Office Action stated that this feature of "generating ordered pairs of pages" is described in Page et al. on page 13 in Section 7.1. However, Section 7.1 of Page et al. merely discusses comparing actual Web traffic to calculated Web traffic. Nowhere is the Applicants' claimed feature of generating ordered pairs of implicit links from the user access log disclosed.

In addition, Pei et al. adds nothing to the cited combination that would render the Applicants' claimed invention obvious. Specifically, Pei et al. merely disclose efficient Web access pattern mining from Web logs. However, nowhere do Pei et al. disclose the Applicants' claimed feature of generating ordered pairs of implicit links from the user access log.

The combination of Page et al. and Pei et al. also fails to appreciate or recognize the advantages of the Applicants' claimed feature of generating ordered pairs of implicit links from the user access log. More specifically, this claimed feature is used to generate and update the implicit link graph (specification, page 23, lines 14-15). Neither Page et al. nor Pei et al. discuss or appreciate these advantages of this claimed feature of the Applicants' invention.

Dependent claim 3 of the Applicant's claimed invention further differentiates the Applicants' claimed invention from the combination of Page et al. and Pei et al. by stating that a two-item sequential pattern mining technique is used to extract the implicit links from the plurality of different browsing sessions. Moreover, dependent claim 9 of the Applicants' claimed invention even further differentiates the Applicants' claimed invention from the combination of Page et al. and Pei et al. by stating that a <u>gliding window</u> is moved <u>over each explicit link path</u> in the user access log to generate the ordered pairs of implicit links. Nowhere do Page et al. or Pei et al. disclose these features.

The Applicant, therefore, submits that obviousness cannot be established since the combination of Page et al. and Pei et al. fails to teach, disclose, suggest or provide any motivation for the Applicants' claimed feature of generating ordered pairs of implicit links from the user access log. In addition to explicitly lacking this feature, Page et al. and Pei et al. fail to implicitly disclose, suggest, or provide motivation for this feature. Further, the combination fails to appreciate advantages of this claimed feature.

Therefore, as set forth in *In re Fine* and MPEP § 2142, the combination of Page et al. and Pei et al. cannot render the Applicants' claimed invention obvious because both Page et al. and Pei et al. are missing at least one material feature of the Applicants' claimed invention discussed above. Consequently, because a prima facie case of obviousness cannot be established due to the lack of "some teaching, suggestion, or incentive supporting the combination", the rejection must be withdrawn. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984); MPEP 2143.01.

Accordingly, the Applicants respectfully submits that amended independent claims 1, 14, 29, 40, and 55 are patentable under 35 U.S.C. § 103(a) over Page et al. in view of Pei et al. based on the amendments to claims 1, 14, 29, 40 and 55 and the legal and technical arguments set forth above and below. Moreover, claims 2-13 depend from amended independent claim 1, claims 15-28 depend from amended independent claim 14, claims 30-32 and 34-39 depend from amended independent claim 29, claims 41-54 depend from amended independent claim 40, and claims 56-63 depend from amended independent claim 55 and are also nonobvious over Page et al. in view of Pei et al. (MPEP § 2143.03). The Applicants, therefore, respectfully requests reexamination, reconsideration and withdrawal of the rejection of claims 1-63 under 35 U.S.C. § 103(a) as being unpatentable over Page et al. in view of Pei et al.
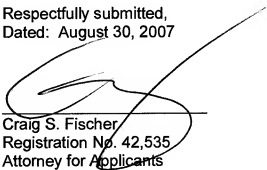
Conclusion

In view of the amendments to claims 1, 14, 29, 40, and 55 and the arguments set forth above, the Applicants submit that claims 1-32 and 34-63 are in condition for

immediate allowance. The Examiner, therefore, is respectfully requested to withdraw the outstanding rejections of the claims and to pass all of the claims of this application to issue.

In an effort to expedite and further the prosecution of the subject application, the Applicants kindly invite the Examiner to telephone the Applicants' attorney at (805) 278-8855 if the Examiner has any comments, questions or concerns, wishes to discuss any aspect of the prosecution of this application, or desires any degree of clarification of this response.

Respectfully submitted,
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